

AMENDMENTS TO THE CLAIMS

Claims 1-11. (canceled)

12. (currently amended) A field emission display device comprising:

at least one current emitter formed of a doped silicon; and

a substrate having a phosphor coating in at least one region positioned to receive electrons emitted by said current emitter,

said current emitter comprising a ~~treated~~ current emission surface comprising doped silicon infused with nitrogen ~~having an atomic concentration of oxygen resulting from treatment of the current emission surface with a plasma enhanced chemical vapor deposition hydrogenation process in the presence of a silane gas followed by a nitrogen infusion process, said atomic concentration of oxygen being smaller than the atomic concentration of oxygen of the current emitter subjected to atmospheric conditions,~~ said current emitter further comprising sides, at least a portion of said sides being surrounded by an insulating layer to prevent current from radiating out of the sides.

13. (original) The device according to claim 12, wherein said current emitter resides on a base substrate covered by a barrier film.

14. (original) The device according to claim 13, wherein said barrier film comprises silicon dioxide.

15. (previously presented) The device according to claim 13, wherein said current emitter has a base on said barrier layer and a projecting top connected with said base.

16. (currently amended) The device according to claim 13, further comprising ~~wherein~~ a conductive layer is deposited over said barrier film.

17. (original) The device according to claim 16, wherein said conductive layer comprises aluminum.

18. (previously presented) The device according to claim 12, wherein said current emitter comprises a tip, and wherein said sides do not include any portion of the tip.

19. (original) The device according to claim 18, wherein said insulating layer comprises silicon dioxide.

20. (original) The device according to claim 18, wherein a silicon grid resides on top of said insulating layer.

21. (original) The device according to claim 20, wherein a metal layer resides on top of said grid.

22. (original) The device according to claim 21, wherein a passivation layer resides on top of said metal layer.

23. (original) The device according to claim 22, wherein said passivation layer comprises nitride.

24. (currently amended) A field emission display device comprising:
at least one current emitter comprising ~~formed of~~ a doped silicon; and
a substrate having a phosphor coating on at least a portion of the substrate,
said coating positioned to receive electrons emitted by the current emitter,

said current emitter comprising a ~~plasma enhanced chemical vapor deposition hydrogenation process treated and subsequently nitrogen infusion process treated~~ current emission surface comprising doped silicon infused with nitrogen, said current emission surface ~~having a concentration of native oxides which is smaller than the concentration of native oxides of the current emission surface subjected to atmospheric conditions.~~

25. (currently amended) The device according to claim 24, wherein said ~~treated~~ current emission surface has an atomic ~~concentration~~ concentrations of oxygen and silicon reduced by a plasma enhanced chemical vapor deposition hydrogenation process and a subsequent nitrogen infusion process to values smaller than the atomic concentration of oxygen and silicon of the current emission surface subjected to atmospheric conditions.

26. (currently amended) A field emission display device comprising:
an array of at least one current emitter emitters formed of a doped silicon;
and

a substrate having a phosphor coating in at least one region positioned to receive electrons emitted by said current emitters ~~emitter~~,

said current emitters each emitter comprising a ~~treated~~ current emission surface comprising doped silicon infused with nitrogen ~~having an atomic concentration of oxygen resulting from treatment of the current emission surface with a silane gas followed by an ammonia gas, said atomic concentration of oxygen being smaller than the atomic concentration of oxygen of the current emission surface subjected to atmospheric conditions.~~

27. (currently amended) A field emission display device comprising:

at least one current emitter formed of a doped silicon; and

a substrate having a phosphor coating in at least one region positioned to receive electrons emitted by said current emitter,

said current emitter comprising a ~~treated~~ current emission surface comprising doped silicon and deposited nitrogen ~~having a reduced atomic concentration of oxygen which is smaller than the atomic concentration of oxygen of the current emission surface subjected to atmospheric conditions, said treated current emission surface having said reduced atomic concentration of oxygen being formed by:~~

(a) ~~exposing at least a portion of said at least one current emitter to a hydrogenation process; and~~

(b) ~~exposing at least a portion of said at least one current emitter to a nitrogen infusion process.~~

28. (currently amended) A field emission display device unit comprising:

a ~~at least one~~ current emitter formed of a doped silicon; and

a substrate having a phosphor coating in at least one region positioned to receive electrons emitted by said current emitter,

said current emitter comprising a ~~treated~~ current emission surface comprising doped silicon infused with nitrogen, ~~said treated current emission surface having an atomic concentration of oxygen smaller than the atomic concentration of oxygen of the current emission surface subjected to atmospheric conditions.~~

29. (currently amended) A field emission display device comprising:

a plurality of ~~at least one~~ current ~~emitter~~ emitters formed of a doped silicon;

and

a substrate having a phosphor coating in at least one region positioned to receive electrons emitted by said current ~~emitter~~ emitters,

said current ~~emitter~~ emitters each comprising a ~~treated~~ current emission surface comprising doped silicon and nitrogen deposited on the doped silicon, ~~said treated current emission surface having an atomic concentration of silicon smaller than the atomic concentration of silicon of the current emission surface subjected to atmospheric conditions.~~

30. (currently amended) A field emission display device comprising:

at least one current emitter formed of a doped silicon; and

a substrate having a phosphor coating in at least one region positioned to receive electrons emitted by said current emitter,

said current emitter comprising a ~~treated~~ current emission surface comprising doped silicon infused with nitrogen, ~~said treated current emission surface having a an atomic concentration of nitrogen greater than the atomic concentration of nitrogen of the current emission surface subjected to atmospheric conditions~~, said current emitter further comprising sides, ~~at least a portion of said sides being~~ surrounded by an insulating layer to prevent current from radiating out of the sides.